



Rhodococcus gene encoding aldoxime dehydratase

Description of Technology: The present invention relates to the fields of molecular biology, biocatalyst development and biotransformation of organic molecules. More specifically, the present invention relates to cloning and expression of a novel Rhodococcus gene encoding an aldoxime dehydratase enzyme.

Patent Listing:

1. **US Patent No. 7,057,030**, Issued June 6, 2006, "Rhodococcus gene encoding aldoxime dehydratase"

<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F7057030>

Market Potential: Aldoximes have the general chemical structure $RHC.dbd.NOH$ where "R" is an aryl or alkyl group. Plants synthesize a variety of aldoximes as intermediates in biochemical pathways leading to compounds that are used as developmental signals and as defenses against pathogens (Hull et al., PNAS USA, 97:2379 84 (2000); Wittstock and Halkier, J Biol Chem, 275:14659 66 (2000)). A variety of microorganisms are known to degrade aldoximes (Kato et al., Appl. Environ. Microbiol., 66:2290 2296 (2000)). Bacteria typically degrade aldoximes by first converting the aldoxime to a nitrile by means of aldoxime dehydratase and subsequently converting the nitrile to a carboxylic acid by means of nitrilase or a combination of nitrile hydratase and amidase (FIG. 1). The ability of plants to synthesize various aldoximes and the possibility of converting an aldoxime into a nitrile, amide or carboxylic acid make aldoximes potentially useful as starting materials or as intermediates in biotransformations.

The problem to be solved therefore is to identify new aldoxime dehydratase genes for use in the recombinant production of nitriles, amides, carboxylic acids, and downstream intermediates in the aldoxime-nitrile-carboxylic acid pathway.

Applicants have solved the stated problem by isolating the gene for aldoxime dehydratase (oxd) from a Rhodococcus erythropolis AN12 strain containing an open reading frame (ORF) that encodes aldoxime dehydratase and by expressing the Rhodococcus oxd gene in E. coli.

Benefits:

- Identifies new aldoxime dehydratase genes

Applications:

- Molecular biology, biocatalyst development, biotransformation of organic molecules

Contact: Ken Anderson

Director, Entrepreneurial & Small Business Support, Delaware Economic Development Office (DEDO)

Carvel State Building, 820 French Street, Wilmington, DE, 19801

Phone: (302) 577-8496, Fax: (302) 577-8499, Email: Kenneth.R.Anderson@state.de.us